ABSTRACT

The agricultural sector has an important role for Indonesian society. As a source of livelihood for many farmers, this sector utilizes large areas of land in various regions. Farmers generally use land to develop agricultural production. However, there is still a lot of land that has not been utilized. As an alternative, the hydroponic cultivation method was introduced to develop agricultural products, both on limited indoor and outdoor land. Challenges such as climate change and non-optimal lighting processes are key factors in photosynthesis and plant growth. Various challenges related to land use and environmental conditions need to be considered for sustainable agricultural practices. To overcome limited land and environmental conditions, the hydroponic farming method with RGB light technology was developed as a solution. The indoor farming system uses a Node MCU microcontroller programmed in C++ language which can automatically regulate the spectrum, intensity and duration of LED light illumination for 12 hours. This reduces dependence on sunlight for photosynthesis and accelerates plant growth, even on a small scale. The design of this tool was reviewed to determine the effect of red and blue RGB light with a ratio of 2:4 and 1:1 on the growth of green bean plants. The results: Growth at a ratio of 2:4 is more dominant in leaf growth which can be seen on day 8 with the highest vertical height growth being 18 cm with a leaf length and width of 9 x 1 cm then at a ratio of 1:1 the plant experiences dominant growth on the vertical side. which can be seen on the 8th day with a vertical height growth of 18.5 cm and leaf growth of 7 x 1 cm.

***Keywords**: hydroponics, lights, LED, NODE MCU, indoor farming, ratio.*